Claims:

1.   A network connection device for connecting an IP
(Internet Protocol) network and a switched telephone network,
comprising:

an IP network interface to the IP network;

5   a line interface to the switched telephone network;

a plurality of conversion processors, each of which
performs conversion between data on the switched
telephone network and an IP packet on the IP network;

a layer-4 switch connected between the IP network
10   interface and the plurality of conversion processors, for
forwarding an IP packet received from the IP network interface
to a selected one of the plurality of conversion processors
depending on a result of analyzing the IP packet at layer 4;
and

15   a multiplexer for multiplexing data received from
the plurality of conversion processors to output a data stream
to the line interface.

2.   The network connection device according to claim 1,
wherein the layer-4 switch determines the selected one of the
20   plurality of conversion processors depending on which one of
a control packet and a data packet the IP packet is.

3.   The network connection device according to claim 1, wherein the layer-4 switch determines the selected one of the plurality of conversion processors based on a source address, a UDP (User Datagram Protocol) header, and a RTP (Real-time

5   Transport Protocol) header of the IP packet.

4.   The network connection device according to claim 1, wherein the plurality of conversion processors include at least one data conversion processor dedicated to conversion of data packet and at least one control conversion processor dedicated

10   to conversion of control packet.

5.   The network connection device according to claim 4, wherein the layer-4 switch forwards an IP packet to a data conversion processor when the IP packet is a data packet, and forwards the IP packet to a control conversion processor when

15   the IP packet is a control packet.

6.   The network connection device according to claim 1, wherein the multiplexer demultiplexes a data stream received from the line interface to transfer demultiplexed data to a selected one of the plurality of conversion processors depending

20   on whether the demultiplexed data is control data.

7.   The network connection device according to claim 6, wherein the plurality of conversion processors include at least

one data conversion processor dedicated to conversion of data

packet and at least one control conversion processor dedicated

to conversion of control packet.

    8.   The network connection device according to claim 6,

5   wherein the layer-4 switch receives packets from the plurality

of conversion processors to transfer them to the IP network

interface.

    9.   A control method for a network connection device

connecting an IP (Internet Protocol) network and a switched

10   telephone network, the network connection device comprising:

        an IP network interface to the IP network;

        a line interface to the switched telephone network; and

        a plurality of conversion processors, each of which

performs conversion between data on the switched

15   telephone network and an IP packet on the IP network,

            the method comprising the steps of:

            a) analyzing an IP packet received from the

IP network interface at layer 4;

            b) forwarding the IP packet to a selected one of the

20   plurality of conversion processors depending on a result of the

step (a); and

            c) converting the IP packet to data on the switched

telephone network by the selected conversion processor.

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10.   The control method according to claim 9, wherein the step (a) comprises the step of determining the selected one of the plurality of conversion processors depending on which one of a control packet and a data packet the IP packet is.

5   11.   The control method according to claim 10, wherein the step (a) comprises the steps of:

determining whether a source address of the IP packet indicates a call agent;

when the source address of the IP packet does not

10   indicate the call agent, inspecting a UDP (User Datagram Protocol) header of the IP packet to determine whether a protocol type code of the IP packet indicates UDP;

when the protocol type code of the IP packet indicates UDP, inspecting an RTP (Real-time Transport Protocol)

15   header of the IP packet to determine whether a destination port number of the IP packet indicates an RTP port working on call connection;

when the destination port number of the IP packet indicates an RTP port working on call connection, determining

20   that the IP packet is forwarded to a conversion processor dedicated to conversion of data packet; and

when the source address of the IP packet indicates the call agent, when the protocol type code of the IP packet does not indicate UDP, or when the destination port number of

25   the IP packet does not indicate an RTP port working on call

connection, determining that the IP packet is forwarded to a
conversion processor dedicated to conversion of control packet.

12.   The control method according to claim 10, further
comprising the steps of:

5   demultiplexing a data stream received from the line
interface to produce demultiplexed data; and

               transferring the demultiplexed data to a selected
one of the plurality of conversion processors depending on
whether the demultiplexed data is control data.

10   13.   A network system comprising:

               an IP (Internet Protocol) network;

               a switched telephone network including a service
switching point;

               a SS7 (signaling system No. 7) gateway allowing the
15   service switching point to exchange SS7 signals;

               a call agent; and

               a voice over IP (VoIP) gateway for connecting the
IP network and the switched telephone network, wherein the VoIP
gateway comprises:

20   an IP network interface to the IP network;

               a line interface to the switched telephone network;

               a plurality of conversion processors, each of which
performs conversion between data on the switched
telephone network and an IP packet on the IP network;

a layer-4 switch connected between the IP network interface and the plurality of conversion processors, for forwarding an IP packet received from the IP network interface to a selected one of the plurality of conversion processors

5   depending on a result of analyzing the IP packet at layer 4; and

a multiplexer for multiplexing data received from the plurality of conversion processors to output a data stream to the line interface.

10   14.   The network system according to claim 13, wherein the plurality of conversion processors include at least one data conversion processor dedicated to conversion of data packet and at least one control conversion processor dedicated to conversion of control packet.

15   15.   The network system according to claim 14, wherein the layer-4 switch forwards an IP packet to a data conversion processor when the IP packet is a data packet, and forwards the IP packet to a control conversion processor when the IP packet is a control packet.